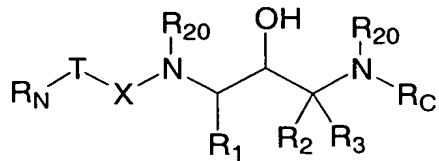


WHAT IS CLAIMED IS:

1. A compound of the formula:



or pharmaceutically acceptable salts or esters thereof;

5 wherein X is $-(\text{C}=\text{O})-$, $-(\text{C}=\text{S})-$, $-S(\text{O})_{n1}-$ or $-(\text{C}=\text{N}-\text{Z})$, wherein
Z = R_{20} or $-\text{OR}_{20}$, and wherein $n1$ is 0, 1 or 2;
T is absent, NR_{20} , or O, with the proviso that when X is
 $-(\text{C}=\text{O})$, T is not absent;
wherein each R_{20} is independently H, -CN, C_{1-6} alkyl or alkenyl,
10 C_{1-6} haloalkyl or C_{4-7} cycloalkyl, with the proviso that
when Z is R_{20} or $-\text{OR}_{20}$, R_{20} is not -CN;
wherein R_1 is $-(\text{CH}_2)_{1-2}-\text{S}(\text{O})_{0-2}-$ (C_{1-6} alkyl), or
15 $\text{C}_{1-\text{C}_{10}}$ alkyl optionally substituted with 1, 2, or 3 groups
independently selected from halogen, -OH, =O, -SH,
-C≡N, -CF₃, -C_{1-C₃} alkoxy, amino, mono- or
dialkylamino, -N(R)C(O)R'-, -OC(=O)-amino and -
OC(=O)-mono- or dialkylamino, or
20 C_{2-C_6} alkenyl or C_{2-C_6} alkynyl, each of which is optionally
substituted with 1, 2, or 3 groups independently
selected from halogen, -OH, -SH, -C≡N, -CF₃, C_{1-C₃}
alkoxy, amino, and mono- or dialkylamino, or
aryl, heteroaryl, heterocyclyl, -C_{1-C₆} alkyl-aryl, -C_{1-C₆}
alkyl-heteroaryl, or -C_{1-C₆} alkyl-heterocyclyl, where
the ring portions of each are optionally substituted
25 with 1, 2, 3, or 4 groups independently selected
from halogen, -OH, -SH, -C≡N, -NR₁₀₅R'₁₀₅, -CO₂R, -
N(R)COR', or -N(R)SO₂R', -C(=O)-(C_{1-C₄}) alkyl, -SO₂-
amino, -SO₂-mono or dialkylamino, -C(=O)-amino,
-C(=O)-mono or dialkylamino, -SO₂-(C_{1-C₄}) alkyl, or

C_1-C_6 alkoxy optionally substituted with 1, 2, or 3 groups which are independently selected from halogen, or

5 C_3-C_7 cycloalkyl optionally substituted with 1, 2, or 3 groups independently selected from halogen, -OH, -SH, -C≡N, -CF₃, C_1-C_3 alkoxy, amino, -C₁-C₆ alkyl and mono- or dialkylamino, or

10 C_1-C_{10} alkyl optionally substituted with 1, 2, or 3 groups independently selected from halogen, -OH, -SH, -C≡N, -CF₃, -C₁-C₃ alkoxy, amino, mono- or dialkylamino and -C₁-C₃ alkyl, or

15 C_2-C_{10} alkenyl or C_2-C_{10} alkynyl each of which is optionally substituted with 1, 2, or 3 groups independently selected from halogen, -OH, -SH, -C≡N, -CF₃, C_1-C_3 alkoxy, amino, C_1-C_6 alkyl and mono- or dialkylamino; and the heterocyclyl group is optionally further substituted with oxo;

R and R' independently are hydrogen, C_1-C_{10} alkyl, C_1-C_{10} alkylaryl or C_1-C_{10} alkylheteroaryl;

20 wherein R_c is

25 (I) $-[-(CH_2)_{(0-8)}-(CH)(alkyl_1)(alkyl_2)]$, where alkyl₁ and alkyl₂ are straight or branched C_{2-10} alkanyl, alkenyl or alkynyl, and wherein alkyl₁ and alkyl₂ attach to the same or different methylene carbon with the remaining open methylene valences occupied by hydrogen, thus forming a branched alkyl chain having between 8 and 20 carbon atoms in total;

30 the alkyl groups, alkyl₁ and alkyl₂ being optionally substituted with one, two or three substituents selected from the group consisting of C_1-C_3 alkyl, halogen, -OH, -SH, -C≡N, -CF₃, C_1-C_3 alkoxy, -O-phenyl, -C(O)C₁-C₃ alkyl, -NR_{1-a}R_{1-b} where R_{1-a} and R_{1-b} are -H or C_1-C_6 alkyl, -OC=O NR_{1-a}R_{1-b}, -S(=O)₀₋₂, -NR_{1-a}C=O NR_{1-a}R_{1-b}, -C=O NR_{1-a}R_{1-b}, and -S(=O)₂ NR_{1-a}R_{1-b};

(II) -(C(Rc-x)(Rc-y))₍₀₋₄₎-Rc-cycle

wherein each Rc-x and Rc-y is independently chosen from:

H

C₁ - C₆ alkyl

5 C₁ - C₆ alkoxy

C₂-C₆ alkenyl or alkynyl

- (CH₂)₀₋₄-Rc-cycle where Rc-cycle is as defined below
and Rc-x and Rc-y may be taken together with the
methylene carbon to which they jointly attach to form a
10 spirocyclic ring of 3 to 7 atoms comprising carbon and up
to 2 of O, S(O)₍₀₋₂₎ and NR_{a'}, wherein is R_{a'} is H or C₁₋₄
alkyl;

wherein the spirocyclic ring may be fused to another
ring to provide a bicyclic ring system comprising
15 carbon and up to 2 of O, S(O)₍₀₋₂₎ and NR_{a'}. and
comprising up to 9 atoms in total including,

Rc-cycle is an aryl, heteroaryl, or cycloalkyl ring or a
fused-ring system consisting of no more than three rings
where each of the rings is the same or different and is
20 an aryl, heteroaryl, or cycloalkyl ring

wherein Rc-cycle is optionally substituted with up to four
substituents independently selected from:

(1) C₁-C₆ alkyl optionally substituted with one,
two or three substituents selected from the group consisting
25 of C₁-C₃ alkyl, halogen, -OH, -SH, -C≡N, -CF₃, C₁-C₃ alkoxy, and
-NR_{1-a}R_{1-b},

(2) C₂-C₆ alkenyl or alkynyl with one or two
unsaturated bonds, optionally substituted with one, two or
three substituents selected from the group consisting of -F, -
30 Cl, -OH, -SH, -C≡N, -CF₃, C₁-C₃ alkoxy, and -NR_{1-a}R_{1-b},
(3) halogen,
(4) C₁-C₆ alkoxy,
(5) -C₁-C₆ alkoxy optionally substituted with
one, two, or three of -F,

(6) $-NR_{N-6}R_{N-7}$ where R_{N-6} and R_{N-7} are the same or different and are selected from the group consisting of:

- (a) -H,
- (b) $-C_1-C_6$ alkyl optionally

5 substituted with one substituent selected from the group consisting of:

- (i) -OH, and
- (ii) -NH₂,
- (c) $-C_1-C_6$ alkyl optionally

10 substituted with one to three -F, -Cl, -Br, or -I,

- (d) $-C_3-C_7$ cycloalkyl,
- (e) -(C₁-C₂ alkyl)-(C₃-C₇ cycloalkyl),
- (f) -(C₁-C₆ alkyl)-O-(C₁-C₃ alkyl),
- (g) $-C_2-C_6$ alkenyl with one or two

15 double bonds,

- (h) $-C_2-C_6$ alkynyl with one or two triple bonds,
- (i) $-C_1-C_6$ alkyl chain with one double bond and one triple bond,

20 above, and

- (j) -R₁-aryl where R₁-aryl is as defined above,
- (k) -R₁-heteroaryl where R₁-heteroaryl is as defined above,

25

- (7) -OH,
- (8) -C≡N,
- (9) C₃-C₇ cycloalkyl, optionally substituted with one, two or three substituents selected from the group consisting of -F, -Cl, -OH, -SH, -C≡N, -CF₃, C₁-C₃ alkoxy, and -NR_{1-a}R_{1-b},

30

- (10) -CO-(C₁-C₄ alkyl),
- (11) -SO₂-NR_{1-a}R_{1-b},
- (12) -CO-NR_{1-a}R_{1-b},
- (13) -SO₂-(C₁-C₄ alkyl),

and when there is a saturated carbon atom in R_c-cycle

(14) oxo,
(15) oxime
(16) ketal rings of 5 to 7 members, and
(17) a spirocyclic ring having from 3 to 7
5 atoms comprising carbon and when the ring size is 4-7 atoms
optionally up to 2 of O, S(O)₀₋₂ and NR_a. (IV) -(CR_{c-x}R_{c-y})₀₋₄-
heteroaryl,
(III) -(CR_{c-x}R_{c-y})₀₋₄-aryl-aryl ,
(IV) -(CR_{c-x}R_{c-y})₀₋₄-aryl-heteroaryl,
10 (V) -(CR_{c-x}R_{c-y})₀₋₄- heteroaryl-aryl,
(VI) -(CR_{c-x}R_{c-y})₀₋₄- heteroaryl-heteroaryl,
(VII) -(CR_{c-x}R_{c-y})₀₋₄- aryl-heterocycle,
(VIII) -(CR_{c-x}R_{c-y})₀₋₄-heteroaryl-heterocycle,
(IX) -(CR_{c-x}R_{c-y})₀₋₄-heterocycle-aryl,
15 (X) -(CR_{c-x}R_{c-y})₀₋₄-heterocycle-heteroaryl,
(XI) -(CR_{c-x}R_{c-y})₀₋₄- heterocycle-heterocycle,
(XII) -[C(R_{c-1})(R_{c-2})]₁₋₃-[CO]₀₋₁-N-(R_{c-3})₂ where each R_{c-1} is
the same or different and is selected from the group
consisting of: H, C₁₋₄ alkyl and C₁₋₄ alkoxy and
20 where each R_{c-2} and R_{c-3} is independently selected from
(A) -C₁-C₆ alkyl, optionally substituted with one,
two or three substituents selected from the group consisting
of C₁-C₃ alkyl, -F, -Cl, -Br, -I, -OH, -SH, -C≡N, -CF₃, C₁-C₆
alkoxy, -O- phenyl, and -NR_{1-a}R_{1-b},
25 (B) C₂-C₆ alkenyl or alkynyl with one or two
unsaturated bonds, optionally substituted with one, two or
three substituents selected from the group consisting of C₁-C₃
alkyl, -F, -Cl, -Br, -I, -OH, -SH, -C≡N, -CF₃, C₁-C₆ alkoxy, -O-
phenyl, and
30 -NR_{1-a}R_{1-b},
(C) -(CH₂)₁₋₂-S(O)₀₋₂-(C₁-C₆ alkyl),
(D) -(CH₂)₀₋₄-C₃-C₇ cycloalkyl optionally substituted
with one, two or three substituents selected from the group
consisting of C₁-C₃ alkyl, -F, -Cl,

-Br, -I, -OH, -SH, -C≡N, -CF₃, C₁-C₆ alkoxy, -O- phenyl, -NR₁-aR_{1-b},

(E) -(CH₂)₀₋₄-5-7 membered heterocycle optionally substituted with one, two or three substituents selected from 5 the group consisting of C₁-C₃ alkyl, -F, -Cl, -Br, -I, -OH, -SH, -C≡N, -CF₃, C₁-C₆ alkoxy, -O- phenyl, oxo, -NR_{1-a}R_{1-b},

(XIII) -CH(aryl)₂ where each aryl is the same or different,

10 (XIV) -CH(heteroaryl)₂ where each heteroaryl is the same or different and are as defined above,

(XVIII) -CH(aryl)(heteroaryl),

wherein R_N is R'₁₀₀, -(CRR')₁₋₆R'₁₀₀, -(CRR')₀₋₆R₁₀₀, -(CRR')₁₋₆O-R'₁₀₀, -(CRR')₁₋₆S-R'₁₀₀, -(CRR')₁₋₆C(=O)-R₁₀₀, -(CRR')₁₋₆SO₂-R₁₀₀, 15 -(CRR')₁₋₆NR₁₀₀-R'₁₀₀ or -SO₂R'₁₀₀, with the proviso that when R_N is -SO₂R'₁₀₀, X is not -S(=O)_n- or -C(=S)-; wherein

R₁₀₀ and R'₁₀₀ independently represent aryl, heteroaryl, -aryl-W-aryl, -aryl-W-heteroaryl, -aryl-W-heterocyclyl,

20 -heteroaryl-W-aryl, -heteroaryl-W-heteroaryl, -heteroaryl-W- heterocyclyl, -heterocyclyl-W-aryl, -heterocyclyl-W-heteroaryl, -heterocyclyl-W-heterocyclyl, -CH[(CH₂)₀₋₂-O-R₁₅₀]-(CH₂)₀₋₂-aryl, -CH[(CH₂)₀₋₂-O-R₁₅₀]-(CH₂)₀₋₂-heterocyclyl or -CH[(CH₂)₀₋₂-O-R₁₅₀]-(CH₂)₀₋₂-heteroaryl,

25 where the ring portions of each are optionally substituted with 1, 2, or 3 groups independently selected from

-OR, -NO₂, halogen, -C≡N, -OCF₃, -CF₃, -(CH₂)₀₋₄O-P(=O)(OR')(OR'), -(CH₂)₀₋₄-CO-NR₁₀₅R'₁₀₅, -(CH₂)₀₋₄O-(CH₂)₀₋₄-CONR₁₀₂R'₁₀₂, -(CH₂)₀₋₄-CO-(C₁-C₁₂ alkyl), -(CH₂)₀₋₄-CO-(C₂-C₁₂ alkenyl), -(CH₂)₀₋₄-CO-(C₂-C₁₂ alkynyl), -(CH₂)₀₋₄-CO-(CH₂)₀₋₄(C₃-C₇ cycloalkyl), -(CH₂)₀₋₄-R₁₁₀, - (CH₂)₀₋₄-R₁₂₀, -(CH₂)₀₋₄-R₁₃₀, -(CH₂)₀₋₄-CO-R₁₁₀, -(CH₂)₀₋₄-CO-R₁₂₀, -(CH₂)₀₋₄-CO-R₁₃₀, -(CH₂)₀₋₄-CO-R₁₄₀, -(CH₂)₀₋₄-

CO-O-R₁₅₀, -(CH₂)₀₋₄-SO₂-NR₁₀₅R'₁₀₅, -(CH₂)₀₋₄-SO-(C₁-C₈ alkyl), -(CH₂)₀₋₄-SO₂-(C₁-C₁₂ alkyl), -(CH₂)₀₋₄-SO₂-(CH₂)₀₋₄-(C₃-C₇ cycloalkyl), -(CH₂)₀₋₄-N(R₁₅₀)-CO-O-R₁₅₀, -(CH₂)₀₋₄-N(R₁₅₀)-CO-N(R₁₅₀)₂, -(CH₂)₀₋₄-N(R₁₅₀)-CS-N(R₁₅₀)₂, -(CH₂)₀₋₄-N(R₁₅₀)-CO-R₁₀₅, -(CH₂)₀₋₄-NR₁₀₅R'₁₀₅, -₅(CH₂)₀₋₄-R₁₄₀, -(CH₂)₀₋₄-O-CO-(C₁-C₆ alkyl), -(CH₂)₀₋₄-O-P(O)-(O-R₁₁₀)₂, -(CH₂)₀₋₄-O-CO-N(R₁₅₀)₂, -(CH₂)₀₋₄-O-CS-N(R₁₅₀)₂, -(CH₂)₀₋₄-O-(R₁₅₀), -(CH₂)₀₋₄-O-R₁₅₀'-COOH, -(CH₂)₀₋₄-S-(R₁₅₀), -(CH₂)₀₋₄-N(R₁₅₀)-SO₂-R₁₀₅, -(CH₂)₀₋₄-C₃-C₇ cycloalkyl, (C₂-C₁₀) alkenyl, or (C₂-C₁₀) alkynyl,
10 or
R₁₀₀ is C₁-C₁₀ alkyl optionally substituted with 1, 2, or 3 R₁₁₅ groups, or
R₁₀₀ is -(C₁-C₆ alkyl)-O-C₁-C₆ alkyl) or -(C₁-C₆ alkyl)-S-(C₁-C₆ alkyl), each of which is optionally substituted with 1, 2, or 3 R₁₁₅ groups, or
₁₅R₁₀₀ is C₃-C₈ cycloalkyl optionally substituted with 1, 2, or 3 R₁₁₅ groups;
W is -(CH₂)₀₋₄-, -O-, -S(O)₀₋₂-, -N(R₁₃₅)-, -CR(OH)- or -C(O)-;
R₁₀₂ and R₁₀₂' independently are hydrogen, or
₂₀C₁-C₁₀ alkyl optionally substituted with 1, 2, or 3 groups that are independently halogen, aryl or -R₁₁₀;
R₁₀₅ and R'₁₀₅ independently represent -H, -R₁₁₀, -R₁₂₀, C₃-C₇ cycloalkyl, -(C₁-C₂ alkyl)-(C₃-C₇ cycloalkyl), -(C₁-C₆ alkyl)-O-(C₁-C₃ alkyl), C₂-C₆ alkenyl, C₂-C₆ alkynyl, or C₁-C₆ alkyl chain with one double bond and one triple bond,
₂₅or
C₁-C₆ alkyl optionally substituted with -OH or -NH₂; or, C₁-C₆ alkyl optionally substituted with 1, 2, or 3 groups independently selected from halogen, or
C₁-C₆ alkyl optionally substituted with 1, 2, or 3 groups independently selected from halogen, or
₃₀R₁₀₅ and R'₁₀₅ together with the atom to which they are attached form a 3 to 7 membered carbocyclic ring, where one member is optionally a heteratom selected from -O-, -S(O)₀₋₂-, -

$N(R_{135})-$, the ring being optionally substituted with 1, 2 or three R_{140} groups;

R_{115} at each occurrence is independently halogen, -OH, $-CO_2R_{102}$, $-C_1-C_6$ thioalkoxy, $-CO_2$ -phenyl, $-NR_{105}R'_{135}$, $-SO_2-(C_1-C_8)$ alkyl), $-C(=O)R_{180}$, R_{180} , $-CONR_{105}R'_{105}$, $-SO_2NR_{105}R'_{105}$, $-NH-CO-(C_1-C_6)$ alkyl), $-NH-C(=O)-OH$, $-NH-C(=O)-OR$, $-NH-C(=O)-O-$ phenyl, $-O-C(=O)-(C_1-C_6)$ alkyl), $-O-C(=O)$ -amino, $-O-C(=O)-$ mono- or dialkylamino, $-O-C(=O)$ -phenyl, $-O-(C_1-C_6)$ alkyl)- CO_2H , $-NH-SO_2-(C_1-C_6)$ alkyl), C_1-C_6 alkoxy or C_1-C_6 haloalkoxy;

R_{135} is C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_3-C_7 cycloalkyl, $-(CH_2)_{0-2-}(aryl)$, $-(CH_2)_{0-2-}(heteroaryl)$, or $-(CH_2)_{0-2-}(heterocyclyl)$;

R_{140} is heterocyclyl optionally substituted with 1, 2, 3, or 4 groups independently selected from C_1-C_6 alkyl, C_1-C_6 alkoxy, halogen, hydroxy, cyano, nitro, amino, mono(C_1-C_6)alkylamino, di(C_1-C_6)alkylamino, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_1-C_6 haloalkyl, C_1-C_6 haloalkoxy, amino(C_1-C_6)alkyl, mono(C_1-C_6)alkylamino(C_1-C_6)alkyl, di(C_1-C_6)alkylamino(C_1-C_6)alkyl, and =O;

R_{150} is hydrogen, C_3-C_7 cycloalkyl, $-(C_1-C_2)$ alkyl)- (C_3-C_7) cycloalkyl), C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_1-C_6 alkyl with one double bond and one triple bond, $-R_{110}$, $-R_{120}$, or C_1-C_6 alkyl optionally substituted with 1, 2, 3, or 4 groups independently selected from -OH, $-NH_2$, C_1-C_3 alkoxy, R_{110} , and halogen;

R_{150}' is C_3-C_7 cycloalkyl, $-(C_1-C_3)$ alkyl)- (C_3-C_7) cycloalkyl), C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_1-C_6 alkyl with one double bond and one triple bond, $-R_{110}$, $-R_{120}$, or C_1-C_6 alkyl optionally substituted with 1, 2, 3, or 4 groups independently selected from -OH, $-NH_2$, C_1-C_3 alkoxy, R_{110} , and halogen;

R_{180} is selected from morpholinyl, thiomorpholinyl, piperazinyl, piperidinyl, homomorpholinyl,

homothiomorpholinyl, homothiomorpholinyl S-oxide, homothiomorpholinyl S,S-dioxide, pyrrolinyl and pyrrolidinyl, each of which is optionally substituted with 1, 2, 3, or 4 groups independently selected from C₁-C₆ alkyl, C₁-C₆ alkoxy, halogen, hydroxy, cyano, nitro, amino, mono(C₁-C₆)alkylamino, di(C₁-C₆)alkylamino, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₁-C₆ haloalkyl, C₁-C₆ haloalkoxy, amino(C₁-C₆)alkyl, mono(C₁-C₆)alkylamino(C₁-C₆)alkyl, di(C₁-C₆)alkylamino(C₁-C₆)alkyl, and =O;

5 R₁₁₀ is aryl optionally substituted with 1 or 2 R₁₂₅ groups; R₁₂₅ at each occurrence is independently halogen, amino, mono- or dialkylamino, -OH, -C≡N, -SO₂-NH₂, -SO₂-NH-C₁-C₆ alkyl, -SO₂-N(C₁-C₆ alkyl)₂, -SO₂-(C₁-C₄ alkyl), -CO-NH₂, -CO-NH-C₁-C₆ alkyl, or -CO-N(C₁-C₆ alkyl)₂, or

10 15 C₁-C₆ alkyl, C₂-C₆ alkenyl or C₂-C₆ alkynyl, each of which is optionally substituted with 1, 2, or 3 groups that are independently selected from C₁-C₃ alkyl, halogen, -OH, -SH, -C≡N, -CF₃, C₁-C₃ alkoxy, amino, and mono- and dialkylamino, or

20 C₁-C₆ alkoxy optionally substituted with one, two or three of halogen;

R₁₂₀ is heteroaryl, which is optionally substituted with 1 or 2 R₁₂₅ groups; and

25 R₁₃₀ is heterocyclyl optionally substituted with 1 or 2 R₁₂₅ groups; and

R₂ is selected from the group consisting of H; C₁-C₆ alkyl, optionally substituted with 1, 2, or 3 substituents that are independently selected from the group consisting of C₁-C₃ alkyl, halogen, -OH, -SH, -C≡N, -CF₃, C₁-C₃ alkoxy, and -NR_{1-a}R_{1-b}; wherein

30 R_{1-a} and R_{1-b} are -H or C₁-C₆ alkyl; -(CH₂)₀₋₄-aryl; -(CH₂)₀₋₄-heteroaryl; C₂-C₆ alkenyl; C₂-C₆ alkynyl; -CONR_{N-2}R_{N-3}; -SO₂NR_{N-2}R_{N-3}; -CO₂H; and -CO₂-(C₁-C₄ alkyl);

R₃ is selected from the group consisting of H; C₁-C₆ alkyl, optionally substituted with 1, 2, or 3 substituents independently selected from the group consisting of C₁-C₃ alkyl, halogen, -OH, -SH, -C≡N, -CF₃, C₁-C₃ alkoxy, and -NR_{1-a}R_{1-b}; -(CH₂)₀₋₄-aryl; -(CH₂)₀₋₄-heteroaryl; C₂-C₆ alkenyl; C₂-C₆ alkynyl; -CO-NR_{N-2}R_{N-3}; -SO₂-NR_{N-2}R_{N-3}; -CO₂H; and -CO-O-(C₁-C₄ alkyl);

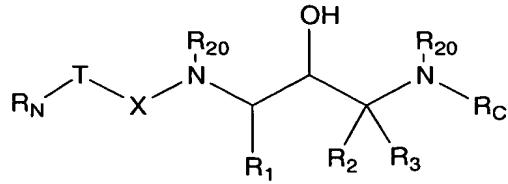
5 wherein

R_{N-2} and R_{N-3} at each occurrence are independently selected from the group consisting of -C₁-C₈ alkyl optionally substituted with 1, 2, or 3 groups independently selected from the group consisting of -OH, -NH₂, phenyl and halogen; -C₃-C₈ cycloalkyl; -(C₁-C₂ alkyl)-(C₃-C₈ cycloalkyl); -(C₁-C₆ alkyl)-O-(C₁-C₃ alkyl); -C₂-C₆ alkenyl; -C₂-C₆ alkynyl; -C₁-C₆ alkyl chain with one double bond and one triple bond; aryl; heteroaryl; heterocycloalkyl; or

R_{N-2}, R_{N-3} and the nitrogen to which they are attached form a 5, 6, or 7 membered heterocycloalkyl or heteroaryl group, 10 wherein said heterocycloalkyl or heteroaryl group is optionally fused to a benzene, pyridine, or pyrimidine ring, and said groups are unsubstituted or substituted with 1, 2, 3, 15 4, or 5 groups that at each occurrence are independently C₁-C₆ alkyl, C₁-C₆ alkoxy, halogen, halo C₁-C₆ alkyl, halo C₁-C₆ 20 alkoxy, -CN, -NO₂, -NH₂, NH(C₁-C₆ alkyl), N(C₁-C₆ alkyl)(C₁-C₆ alkyl), -OH, -C(O)NH₂, -C(O)NH(C₁-C₆ alkyl), -C(O)N(C₁-C₆ 25 alkyl)(C₁-C₆ alkyl), C₁-C₆ alkoxy C₁-C₆ alkyl, C₁-C₆ thioalkoxy, and C₁-C₆ thioalkoxy C₁-C₆ alkyl; or

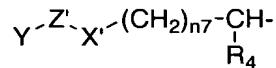
R₂, R₃ and the carbon to which they are attached form a carbocycle of three thru seven carbon atoms, wherein one carbon atom is optionally replaced by a group selected from -O-, -S-, -SO₂-, or -NR_{N-2}-.

2. A compound of the formula:



or a pharmaceutically acceptable salt or ester thereof;
wherein X, T, R₂₀, R₁, R₂, R₃ and R_C are as defined in claim 1
and wherein R_N is

5



wherein

R₄ is selected from the group consisting of H; NH₂; -NH-(CH₂)_{n₆}-R₄₋₁; -NHR₈; -NR₅₀C(O)R₅; C₁-C₄ alkyl-NHC(O)R₅;
-(CH₂)₀₋₄R₈; -O-C₁-C₄ alkanoyl; OH; C₆-C₁₀ aryloxy optionally substituted with 1, 2, or 3 groups that are independently halogen, C₁-C₄ alkyl, -CO₂H, -C(O)-C₁-C₄ alkoxy, or C₁-C₄ alkoxy; C₁-C₆ alkoxy; aryl C₁-C₄ alkoxy; -NR₅₀CO₂R₅₁; -C₁-C₄ alkyl-NR₅₀CO₂R₅₁; -C≡N; -CF₃; -CF₂-CF₃; -C≡CH; -CH₂-CH=CH₂; -(CH₂)₁₋₄-R₄₋₁; -(CH₂)₁₋₄-NH-R₄₋₁; -O-(CH₂)_{n₆}-R₄₋₁; -S-(CH₂)_{n₆}-R₄₋₁; -(CH₂)₀₋₄-NHC(O)-(CH₂)₀₋₆-R₅₂; -(CH₂)₀₋₄-R₅₃-(CH₂)₀₋₄-R₅₄;

wherein

n₆ is 0, 1, 2, or 3;

n₇ is 0, 1, 2, or 3;

20 R₄₋₁ is selected from the group consisting of -SO₂-(C₁-C₈ alkyl), -SO-(C₁-C₈ alkyl), -S-(C₁-C₈ alkyl), -S-CO-(C₁-C₆ alkyl), -SO₂-NR₄₋₂R₄₋₃; -CO-C₁-C₂ alkyl; -CO-NR₄₋₃R₄₋₄;

R₄₋₂ and R₄₋₃ are independently H, C₁-C₃ alkyl, or C₃-C₆ cycloalkyl;

R₄₋₄ is alkyl, arylalkyl, alkanoyl, or arylalkanoyl;

R₄₋₆ is H or C₁-C₆ alkyl;

25 R₅ is selected from the group consisting of C₃-C₇ cycloalkyl; C₁-C₆ alkyl optionally substituted with 1, 2, or 3 groups that are independently halogen,

-NR₆R₇, C₁-C₄ alkoxy, C₅-C₆ heterocycloalkyl, C₅-C₆
heteroaryl, C₆-C₁₀ aryl, C₃-C₇ cycloalkyl C₁-C₄ alkyl,
-S-C₁-C₄ alkyl, -SO₂-C₁-C₄ alkyl, -CO₂H, -CONR₆R₇, -CO₂-
C₁-C₄ alkyl, C₆-C₁₀ aryloxy; heteroaryl optionally
5 substituted with 1, 2, or 3 groups that are
independently C₁-C₄ alkyl, C₁-C₄ alkoxy, halogen, C₁-C₄
haloalkyl, or OH; heterocycloalkyl optionally
substituted with 1, 2, or 3 groups that are
independently C₁-C₄ alkyl, C₁-C₄ alkoxy, halogen, or
10 C₂-C₄ alkanoyl; aryl optionally substituted with 1,
2, 3, or 4 groups that are independently halogen, OH,
C₁-C₄ alkyl, C₁-C₄ alkoxy, or C₁-C₄ haloalkyl; and
-NR₆R₇; wherein
15 R₆ and R₇ are independently selected from the group
consisting of H, C₁-C₆ alkyl, C₂-C₆ alkanoyl,
phenyl, -SO₂-C₁-C₄ alkyl, phenyl C₁-C₄ alkyl;
R₈ is selected from the group consisting of -SO₂-
heteroaryl, -SO₂-aryl, -SO₂-heterocycloalkyl, -SO₂-C₁-
20 C₁₀ alkyl, -C(O)NHR₉, heterocycloalkyl, -S-C₁-C₆
alkyl, -S-C₂-C₄ alkanoyl, wherein
R₉ is aryl C₁-C₄ alkyl, C₁-C₆ alkyl, or H;
R₅₀ is H or C₁-C₆ alkyl;
R₅₁ is selected from the group consisting of aryl C₁-C₄
25 alkyl; C₁-C₆ alkyl optionally substituted with 1, 2,
or 3 groups that are independently halogen, cyano,
heteroaryl, -NR₆R₇, -C(O)NR₆R₇, C₃-C₇ cycloalkyl, or
-C₁-C₄ alkoxy; heterocycloalkyl optionally
substituted with 1 or 2 groups that are independently
30 C₁-C₄ alkyl, C₁-C₄ alkoxy, halogen, C₂-C₄ alkanoyl,
aryl C₁-C₄ alkyl, and -SO₂ C₁-C₄ alkyl; alkenyl;
alkynyl; heteroaryl optionally substituted with 1, 2,
or 3 groups that are independently OH, C₁-C₄ alkyl,
C₁-C₄ alkoxy, halogen, NH₂, NH(C₁-C₆ alkyl) or N(C₁-C₆
alkyl)(C₁-C₆ alkyl); heteroarylalkyl optionally

substituted with 1, 2, or 3 groups that are independently C₁-C₄ alkyl, C₁-C₄ alkoxy, halogen, NH₂, NH(C₁-C₆ alkyl) or N(C₁-C₆ alkyl)(C₁-C₆ alkyl); aryl; heterocycloalkyl; C₃-C₈ cycloalkyl; and
5 cycloalkylalkyl; wherein the aryl; heterocycloalkyl, C₃-C₈ cycloalkyl, and cycloalkylalkyl groups are optionally substituted with 1, 2, 3, 4 or 5 groups that are independently halogen, CN, NO₂, C₁-C₆ alkyl, C₁-C₆ alkoxy, C₂-C₆ alkanoyl, C₁-C₆ haloalkyl, C₁-C₆ haloalkoxy, hydroxy, C₁-C₆ hydroxyalkyl, C₁-C₆ alkoxy C₁-C₆ alkyl, C₁-C₆ thioalkoxy, C₁-C₆ thioalkoxy C₁-C₆ alkyl, or C₁-C₆ alkoxy C₁-C₆ alkoxy;
10 R₅₂ is heterocycloalkyl, heteroaryl, aryl, cycloalkyl, -S(O)₀₋₂-C₁-C₆ alkyl, CO₂H, -C(O)NH₂, -C(O)NH(alkyl), -C(O)N(alkyl)(alkyl), -CO₂-alkyl, -NHS(O)₀₋₂-C₁-C₆ alkyl, -N(alkyl)S(O)₀₋₂-C₁-C₆ alkyl, -S(O)₀₋₂-heteroaryl, -S(O)₀₋₂-aryl, -NH(arylalkyl), -N(alkyl)(arylalkyl), thioalkoxy, or alkoxy, each of which is optionally substituted with 1, 2, 3, 4, or 5 groups that are independently alkyl, alkoxy, thioalkoxy, halogen, haloalkyl, haloalkoxy, alkanoyl, NO₂, CN, alkoxycarbonyl, or aminocarbonyl;
15 R₅₃ is absent, -O-, -C(O)-, -NH-, -N(alkyl)-, -NH-S(O)₀₋₂-, -N(alkyl)-S(O)₀₋₂-, -S(O)₀₋₂-NH-, -S(O)₀₋₂- N(alkyl)-, -NH-C(S)-, or -N(alkyl)-C(S)-;
20 R₅₄ is heteroaryl, aryl, arylalkyl, heterocycloalkyl, CO₂H, -CO₂-alkyl, -C(O)NH(alkyl), -C(O)N(alkyl) (alkyl), -C(O)NH₂, C₁-C₈ alkyl, OH, aryloxy, alkoxy, arylalkoxy, NH₂, NH(alkyl), N(alkyl) (alkyl), or -C₁-C₆ alkyl-CO₂-C₁-C₆ alkyl, each of which is optionally substituted with 1, 2, 3, 4, or 5 groups that are independently alkyl, alkoxy, CO₂H, -CO₂-alkyl, thioalkoxy, halogen, haloalkyl, haloalkoxy,
25

hydroxyalkyl, alkanoyl, NO₂, CN, alkoxycarbonyl, or aminocarbonyl;

X' is selected from the group consisting of -C₁-C₆ alkylidenyl optionally substituted with 1, 2, or 3 methyl groups; and -NR₄₋₆₋; or

R₄ and R₄₋₆ combine to form -(CH₂)_{n10-}, wherein n₁₀ is 1, 2, 3, or 4;

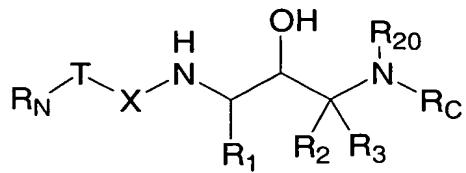
Z' is selected from the group consisting of a bond; SO₂; SO; S; and C(O);

Y is selected from the group consisting of H; C₁-C₄ haloalkyl; C₅-C₆ heterocycloalkyl; C₆-C₁₀ aryl; OH; -N(Y₁)(Y₂); C₁-C₁₀ alkyl optionally substituted with 1 thru 3 substituents which can be the same or different and are selected from the group consisting of halogen, hydroxy, alkoxy, thioalkoxy, and haloalkoxy; C₃-C₈ cycloalkyl optionally substituted with 1, 2, or 3 groups independently selected from C₁-C₃ alkyl, and halogen; alkoxy; aryl optionally substituted with halogen, alkyl, alkoxy, CN or NO₂; arylalkyl optionally substituted with halogen, alkyl, alkoxy, CN or NO₂; wherein

Y₁ and Y₂ are the same or different and are H; C₁-C₁₀ alkyl optionally substituted with 1, 2, or 3 substituents selected from the group consisting of halogen, C₁-C₄ alkoxy, C₃-C₈ cycloalkyl, and OH; C₂-C₆ alkenyl; C₂-C₆ alkanoyl; phenyl; -SO₂-C₁-C₄ alkyl; phenyl C₁-C₄ alkyl; or C₃-C₈ cycloalkyl C₁-C₄ alkyl; or

Y₁, Y₂ and the nitrogen to which they are attached form a ring selected from the group consisting of piperazinyl, piperidinyl, morpholinyl, and pyrrolidinyl, wherein each ring is optionally substituted with 1, 2, 3, or 4 groups that are independently C₁-C₆ alkyl, C₁-C₆ alkoxy, C₁-C₆ alkoxy C₁-C₆ alkyl, or halogen.

3. A compound according to claim 1 of the formula



or a pharmaceutically acceptable salt or ester thereof wherein
 R_C is selected from -(CH₂)₀₋₃-(C₃-C₈) cycloalkyl wherein the
 cycloalkyl is optionally substituted with 1, 2, or 3
 5 groups independently selected from -R₂₀₅; and -CO₂-(C₁-C₄
 alkyl); -(CR₂₄₅R₂₅₀)₀₋₄-aryl; -(CR₂₄₅R₂₅₀)₀₋₄-heteroaryl;
 -(CR₂₄₅R₂₅₀)₀₋₄-heterocycloalkyl; -(CR₂₄₅R₂₅₀)₀₋₄-aryl-
 heteroaryl; -(CR₂₄₅R₂₅₀)₀₋₄-aryl-heterocycloalkyl;
 -(CR₂₄₅R₂₅₀)₀₋₄-aryl-aryl; -(CR₂₄₅R₂₅₀)₀₋₄-heteroaryl-aryl;
 10 -(CR₂₄₅R₂₅₀)₀₋₄-heteroaryl-heterocycloalkyl; -(CR₂₄₅R₂₅₀)₀₋₄-
 heteroaryl-heteroaryl; -CHR₂₄₅-CHR₂₅₀-aryl; -(CR₂₄₅R₂₅₀)₀₋₄-
 heterocycloalkyl-heteroaryl; -(CR₂₄₅R₂₅₀)₀₋₄-
 heterocycloalkyl-aryl; a monocyclic or bicyclic ring of 5,
 15 6, 7 8, 9, or 10 carbons fused to 1 or 2 aryl, heteroaryl,
 or heterocycloalkyl groups;
 wherein 1, 2 or 3 carbons of the monocyclic or bicyclic ring
 are optionally replaced with -NH-, -N(CO)₀₋₁R₂₁₅-,
 20 -N(CO)₀₋₁R₂₂₀-, -O-, or -S(=O)₀₋₂, and wherein the
 monocyclic or bicyclic ring is optionally substituted with
 1, 2 or 3 groups that are independently -R₂₀₅, -R₂₄₅, -R₂₅₀
 or =O;
 and -C₂-C₆ alkenyl optionally substituted with 1, 2, or 3
 R₂₀₅ groups;
 25 wherein each aryl or heteroaryl group attached directly or
 indirectly to the -(CR₂₄₅R₂₅₀)₀₋₄ group is optionally
 substituted with 1, 2, 3 or 4 R₂₀₀ groups;
 wherein each heterocycloalkyl attached directly or
 30 indirectly to the -(CR₂₄₅R₂₅₀)₀₋₄ group is optionally
 substituted with 1, 2, 3, or 4 R₂₁₀;
 R₂₀₀ at each occurrence is independently selected from
 -C₁-C₆ alkyl optionally substituted with 1, 2,

or 3 R₂₀₅ groups; -OH; -NO₂; -halogen; -C≡N;
-(CH₂)₀₋₄-CO-NR₂₂₀R₂₂₅; -(CH₂)₀₋₄-CO-(C₁-C₈ alkyl);
-(CH₂)₀₋₄-CO-(C₂-C₈ alkenyl); -(CH₂)₀₋₄-CO-(C₂-C₈ alkynyl); -(CH₂)₀₋₄-CO-(C₃-C₇ cycloalkyl); -(CH₂)₀₋₄-(CO)₀₋₁-aryl; -(CH₂)₀₋₄-(CO)₀₋₁-heteroaryl;
-(CH₂)₀₋₄-(CO)₀₋₁-heterocycloalkyl; -(CH₂)₀₋₄-CO₂R₂₁₅; -(CH₂)₀₋₄-SO₂-NR₂₂₀R₂₂₅; -(CH₂)₀₋₄-S(O)₀₋₂₋(C₁-C₈ alkyl); -(CH₂)₀₋₄-S(O)₀₋₂₋(C₃-C₇ cycloalkyl); -(CH₂)₀₋₄-N(H or R₂₁₅)-CO₂R₂₁₅; -(CH₂)₀₋₄-N(H or R₂₁₅)-SO₂-R₂₂₀; -(CH₂)₀₋₄-N(H or R₂₁₅)-CO-N(R₂₁₅)₂; -(CH₂)₀₋₄-N(-H or R₂₁₅)-CO-R₂₂₀; -(CH₂)₀₋₄-NR₂₂₀R₂₂₅; -(CH₂)₀₋₄-O-CO-(C₁-C₆ alkyl);
-(CH₂)₀₋₄-O-(R₂₁₅); -(CH₂)₀₋₄-S-(R₂₁₅); -(CH₂)₀₋₄-O-(C₁-C₆ alkyl optionally substituted with 1, 2, 3, or 5 -F); -C₂-C₆ alkenyl optionally substituted with 1 or 2 R₂₀₅ groups; -C₂-C₆ alkynyl optionally substituted with 1 or 2 R₂₀₅ groups; adamantly, and -(CH₂)₀₋₄-C₃-C₇ cycloalkyl;
each aryl and heteroaryl group included within R₂₀₀ is optionally substituted with 1, 2, or 3 groups that are independently -R₂₀₅, -R₂₁₀ or -C₁-C₆ alkyl substituted with 1, 2, or 3 groups that are independently R₂₀₅ or R₂₁₀; each heterocycloalkyl group included within R₂₀₀ is optionally substituted with 1, 2, or 3 groups that are independently R₂₁₀; R₂₀₅ at each occurrence is independently selected from -C₁-C₆ alkyl, -C₂-C₆ alkenyl, -C₂-C₆ alkynyl, -C₁-C₆ haloalkoxy, -(CH₂)₀₋₃(C₃-C₇ cycloalkyl), -halogen, -(CH₂)₀₋₆-OH, -O-phenyl, OH, SH, -(CH₂)₀₋₆C≡N, -(CH₂)₀₋₆-C(=O)NR₂₃₅R₂₄₀, -CF₃, -C₁-C₆ alkoxy, C₁-C₆ alkoxy carbonyl, and -NR₂₃₅R₂₄₀;

R₂₁₀ at each occurrence is independently selected from -C₁-C₆ alkyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -C₂-C₆ alkenyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; C₁-C₆ alkanoyl; -SO₂-(C₁-C₆ alkyl); -C₂-C₆ alkynyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -halogen; -C₁-C₆ alkoxy; -C₁-C₆ haloalkoxy; -NR₂₂₀R₂₂₅; -OH; -C≡N; -C₃-C₇ cycloalkyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -CO-(C₁-C₄ alkyl); -SO₂-NR₂₃₅R₂₄₀; -CO-NR₂₃₅R₂₄₀; -SO₂-(C₁-C₄ alkyl); and =O;

5 R₂₁₅ at each occurrence is independently selected from -C₁-C₆ alkyl, -(CH₂)₀₋₂₋(aryl), -C₂-C₆ alkenyl, --C₂-C₆ alkynyl, -C₃-C₇ cycloalkyl, -(CH₂)₀₋₂₋(heteroaryl), and -(CH₂)₀₋₂₋(heterocycloalkyl); wherein the aryl group included within R₂₁₅ is optionally substituted with 1, 2, or 3 groups that are independently -R₂₀₅ or -R₂₁₀; wherein the heterocycloalkyl and heteroaryl groups included within R₂₁₅ are optionally substituted with 1, 2, or 3 R₂₁₀;

10 R₂₂₀ at each occurrence is independently H, -C₁-C₆ alkyl, -CHO, hydroxy C₁-C₆ alkyl, C₁-C₆ alkoxy carbonyl, -amino C₁-C₆ alkyl, -SO₂-C₁-C₆ alkyl, C₁-C₆ alkanoyl optionally substituted with up to three halogens, -C(O)NH₂, -C(O)NH(C₁-C₆ alkyl), -C(O)N(C₁-C₆ alkyl)(C₁-C₆ alkyl), -halo C₁-C₆ alkyl, -(CH₂)₀₋₂₋(C₃-C₇ cycloalkyl), -(C₁-C₆ alkyl)-O-(C₁-C₃ alkyl), -C₂-C₆ alkenyl, -C₂-C₆ alkynyl, -aryl, -heteroaryl, or -heterocycloalkyl; wherein the aryl, heteroaryl and heterocycloalkyl groups included within R₂₂₀ and R₂₂₅ is optionally substituted with 1, 2, or 3 R₂₇₀ groups,

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R₂₇₀ at each occurrence is independently -R₂₀₅, -C₁-C₆ alkyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -C₂-C₆ alkenyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -C₂-C₆ alkynyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -phenyl; -halogen; -C₁-C₆ alkoxy; -C₁-C₆ haloalkoxy; -NR₂₃₅R₂₄₀; -OH; -C≡N; -C₃-C₇ cycloalkyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -CO-(C₁-C₄ alkyl); -SO₂-NR₂₃₅R₂₄₀; -CO-NR₂₃₅R₂₄₀; -SO₂-(C₁-C₄ alkyl); and =O;

R₂₃₅ and R₂₄₀ at each occurrence are independently -H, -C₁-C₆ alkyl, C₂-C₆ alkanoyl, -SO₂-(C₁-C₆ alkyl), or -phenyl;

R₂₄₅ and R₂₅₀ at each occurrence are independently selected from H, -(CH₂)₀₋₄CO₂C₁-C₄ alkyl, -(CH₂)₀₋₄C(=O)C₁-C₄ alkyl, -C₁-C₄ alkyl, -C₁-C₄ hydroxylalkyl, -C₁-C₄ alkoxy, -C₁-C₄ haloalkoxy, -(CH₂)₀₋₄-C₃-C₇ cycloalkyl, -C₂-C₆ alkenyl, -C₂-C₆ alkynyl, -(CH₂)₀₋₄ aryl, -(CH₂)₀₋₄ heteroaryl, and -(CH₂)₀₋₄ heterocycloalkyl, or

R₂₄₅ and R₂₅₀ are taken together with the carbon to which they are attached to form a monocycle or bicyclic of 3, 4, 5, 6, 7 or 8 carbon atoms, where 1, 2, or 3 carbon atoms are optionally replaced by 1, 2, or 3 groups that are independently -O-, -S-, -SO₂-, -C(O)-, -NR₂₂₀-, or -NR₂₂₀R₂₂₀- wherein both R₂₂₀ groups are alkyl; and wherein the ring is optionally substituted with 1, 2, 3, 4, 5, or 6 groups that are independently C₁-C₄ alkyl, C₁-C₄ alkoxy, hydroxyl, NH₂, NH(C₁-C₆ alkyl), N(C₁-C₆ alkyl)(C₁-C₆ alkyl), -NH-C(O)C₁-C₅ alkyl, -NH-SO₂-(C₁-C₆ alkyl), or halogen; wherein the aryl, heteroaryl or heterocycloalkyl groups included within R₂₄₅ and R₂₅₀ are optionally

substituted with 1, 2, or 3 groups that are independently halogen, C₁₋₆ alkyl, CN or OH.

4. A compound according to claim 3, wherein

5 R₁ is C_{1-C₁₀} alkyl optionally substituted with 1 or 2 groups independently selected from halogen, -OH, =O, -CN, -CF₃, -OCF₃, -C_{3-C₇} cycloalkyl, -C_{1-C₄} alkoxy, amino, mono-dialkylamino, aryl, heteroaryl or heterocycloalkyl, wherein the aryl group is optionally substituted with 1 or 2 R₅₀ groups;

10 R₅₀ is halogen, OH, CN, -CO-(C_{1-C₄} alkyl), -NR₇R₈, C_{1-C₆} alkyl, C_{2-C₆} alkenyl, C_{2-C₆} alkynyl, C_{1-C₆} alkoxy, and C_{3-C₈} cycloalkyl;

15 R₇ and R₈ are selected from H; -C_{1-C₄} alkyl optionally substituted with 1, 2, or 3 groups selected from -OH, -NH₂ and halogen; -C_{3-C₆} cycloalkyl; -(C_{1-C₄} alkyl)-O-(C_{1-C₄} alkyl); -C_{2-C₄} alkenyl; and -C_{2-C₄} alkynyl;

20 R_c is selected from -(CR₂₄₅R₂₅₀)₀₋₄-aryl; -(CR₂₄₅R₂₅₀)₀₋₄-heteroaryl; -(CR₂₄₅R₂₅₀)₀₋₄-heterocycloalkyl; where the aryl and heteroaryl groups attached to the -(CR₂₄₅R₂₅₀)₀₋₄- group are optionally substituted with 1, 2, 3 or 4 R₂₀₀ groups; where the heterocycloalkyl group attached to the -(CR₂₄₅R₂₅₀)₀₋₄ group is optionally substituted with 1, 2, 3, or 4 R₂₁₀ groups; and

25 R₂₄₅ R₂₅₀, R₂₀₀, and R₂₁₀ are as defined above.

5. A compound according to claim 4, wherein

30 R_c is -(CR₂₄₅R₂₅₀)₀₋₄-heterocycloalkyl; where the heterocycloalkyl group attached to the -(CR₂₄₅R₂₅₀)₀₋₄- group is optionally substituted with 1, 2, 3, or 4 R₂₁₀ groups, wherein R₂₄₅, R₂₅₀, and R₂₁₀ are as defined above.

6. A compound according to claim 5, wherein

R₁ is C₁-C₁₀ alkyl substituted with one aryl group, where the aryl group is optionally substituted with 1 or 2 R₅₀ groups;

R_C is -(CR₂₄₅R₂₅₀)₁₋₄-aryl or -(CR₂₄₅R₂₅₀)₁₋₄-heteroaryl,

5 R₂₄₅ and R₂₅₀ are independently selected from H, -(CH₂)₀₋₄CO₂C₁-C₄ alkyl, -(CH₂)₀₋₄CO₂H, -C₁-C₄ alkyl, -(C₁-C₄ alkyl)OH, or

R₂₄₅, R₂₅₀ and the carbon to which they are attached form a monocycle or bicyclic system of 3, 4, 5, 6, 7 or 8 carbon atoms, where
10 1 or 2 carbon atoms are optionally replaced by -O-, -S-, -SO₂-, or -NR₂₂₀-, where R₂₂₀ is as defined above; and

wherein the aryl and heteroaryl groups attached to the -(CR₂₄₅R₂₅₀)₁₋₄- groups are optionally substituted with 1 or 2 R₂₀₀ groups.

15

7. A compound according to claim 3, wherein

R_C is (CR₂₄₅R₂₅₀)₁-aryl, where the aryl (preferably phenyl or naphthyl, more preferably phenyl) is optionally substituted with 1, 2, or 3 R₂₀₀ groups; and

20 R₂₄₅ is H and R₂₅₀ is H or C₁-C₆ alkyl; or

R₂₄₅ and R₂₅₀ are independently C₁-C₃ alkyl (preferably both are methyl); or

CR₂₄₅R₂₅₀ represents a C₃-C₇ cycloalkyl group.

25

8. A compound according to claim 7, wherein

the (CR₂₄₅R₂₅₀)₁-aryl is (CR₂₄₅R₂₅₀)₁-phenyl where the phenyl is optionally substituted with 1, 2, or 3 R₂₀₀ groups.

30

9. A compound according to claim 8, wherein the phenyl

in (CR₂₄₅R₂₅₀)₁-phenyl is substituted with

1-3 independently selected R₂₀₀ groups, or

1 or 2 independently selected R₂₀₀ groups, and

1 heteroaryl group optionally substituted with 1 R₂₀₀ group or

1 phenyl group optionally substituted with 1 R₂₀₀ group.

10. A compound according to claim 8, wherein R₂₄₅ is hydrogen and R₂₅₀ is C₁-C₃ alkyl.

5 11. A compound according to claim 8, wherein R₂₄₅ and R₂₅₀ are both hydrogen.

12. A compound according to claim 8, wherein the phenyl in (CR₂₄₅R₂₅₀)₁-phenyl is substituted with

10 (a) 1 R₂₀₀ group and 1 heteroaryl group optionally substituted with 1 R₂₀₀ group; or

(b) 1 R₂₀₀ group and 1 phenyl group optionally substituted with 1 R₂₀₀ group; or

15 (c) 1 R₂₀₀ group, and 1 heterocycloalkyl which is optionally substituted with one R₂₀₀ or =O.

13. A compound according to claim 12, wherein CR₂₄₅R₂₅₀ represents a C₃-C₇ cycloalkyl group.

20 14. A compound according to claim 12, wherein CR₂₄₅R₂₅₀ represents a C₅-C₇ cycloalkyl group.

15. A compound according to claim 12, wherein CR₂₄₅R₂₅₀ represents a C₃-C₆ cycloalkyl group.

25

16. A compound according to claim 12, wherein CR₂₄₅R₂₅₀ represents a C₆ cycloalkyl.

17. A compound according to claim 8, wherein the phenyl in (CR₂₄₅R₂₅₀)₁-phenyl is substituted with

30 1 R₂₀₀ group; or

1 R₂₀₀ group and one heteroaryl group optionally substituted with one R₂₀₀ group or

1 R₂₀₀ group and one phenyl group optionally substituted with one R₂₀₀ group.

18. A compound according to claim 8, wherein the phenyl 5 in (CR₂₄₅R₂₅₀)₁-phenyl is substituted with 1 R₂₀₀ group.

19. A compound selected from the group consisting of:
phenyl ((1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-{[(1*S*)-7-ethyl-1,2,3,4-tetrahydronaphthalen-1-yl]amino}-2-hydroxypropyl)carbamate;

methyl (3*S*)-3-{[(2*R*,3*S*)-3-[(anilinocarbonyl)amino]-4-(3,5-difluorophenyl)-2-hydroxybutyl]amino}-3-(3-bromophenyl)propanoate;

N-((1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-{[4-(3-ethylphenyl)tetrahydro-2*H*-pyran-4-yl]amino}-2-hydroxypropyl)-N'-phenylurea;

N-((1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-{[(4*R*)-6-ethyl-2,2-dioxido-3,4-dihydro-1*H*-isothiochromen-4-yl]amino}-2-hydroxypropyl)methanesulfonamide;

N-benzyl-N'-((1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-{[(4*R*)-6-ethyl-2,2-dioxido-3,4-dihydro-1*H*-isothiochromen-4-yl]amino}-2-hydroxypropyl)urea;

N-((1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-{[(4*R*)-6-ethyl-2,2-dioxido-3,4-dihydro-1*H*-isothiochromen-4-yl]amino}-2-hydroxypropyl)-N'-phenylurea;

N-((1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-{[(4*R*)-6-ethyl-2,2-dioxido-3,4-dihydro-1*H*-isothiochromen-4-yl]amino}-2-hydroxypropyl)-N'-propylurea;

N-(sec-butyl)-N'-((1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-{[(4*R*)-6-ethyl-2,2-dioxido-3,4-dihydro-1*H*-isothiochromen-4-yl]amino}-2-hydroxypropyl)urea;

phenyl ((1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-{[(4*R*)-6-ethyl-2,2-dioxido-3,4-dihydro-1*H*-isothiochromen-4-yl]amino}-2-hydroxypropyl)carbamate;

ethyl ((1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-{[(4*R*)-6-ethyl-2,2-dioxido-3,4-dihydro-1*H*-isothiochromen-4-yl]amino}-2-hydroxypropyl)carbamate;

N-{(1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-[(6-ethyl-3,4-dihydro-2*H*-chromen-4-yl)amino]-2-hydroxypropyl}-*N'*-phenylurea;

N-{(1*S*,2*R*)-1-(3,5-difluorobenzyl)-2-hydroxy-3-[(6-isopropyl-3,4-dihydro-2*H*-chromen-4-yl)amino]propyl}-*N'*-phenylurea;

N-[(1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-({6-[(dimethylamino)methyl]-3,4-dihydro-2*H*-chromen-4-yl}amino)-2-hydroxypropyl]-*N'*-phenylurea;

phenyl {(1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-[(6-ethyl-3,4-dihydro-2*H*-chromen-4-yl)amino]-2-hydroxypropyl}carbamate;

phenyl {(1*S*,2*R*)-1-(3,5-difluorobenzyl)-2-hydroxy-3-[(6-isopropyl-3,4-dihydro-2*H*-chromen-4-yl)amino]propyl}carbamate;

phenyl [(1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-({6-[(dimethylamino)methyl]-3,4-dihydro-2*H*-chromen-4-yl}amino)-2-hydroxypropyl]carbamate;

N-{(1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-[(6-ethyl-3,4-dihydro-1*H*-isochromen-4-yl)amino]-2-hydroxypropyl}-*N'*-phenylurea;

N-{(1*S*,2*R*)-1-(3,5-difluorobenzyl)-2-hydroxy-3-[(6-isopropyl-3,4-dihydro-1*H*-isochromen-4-yl)amino]propyl}-*N'*-phenylurea;

N-[(1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-({6-[(dimethylamino)methyl]-3,4-dihydro-1*H*-isochromen-4-yl}amino)-2-hydroxypropyl]-*N'*-phenylurea;

phenyl {(1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-[(6-ethyl-3,4-dihydro-1*H*-isochromen-4-yl)amino]-2-hydroxypropyl}carbamate;

phenyl {(1*S*,2*R*)-1-(3,5-difluorobenzyl)-2-hydroxy-3-

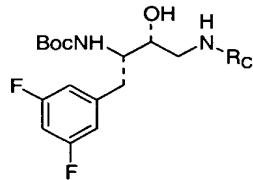
[(6-isopropyl-3,4-dihydro-1*H*-isochromen-4-yl)amino]propyl}carbamate;

phenyl [(1*S*,2*R*)-1-(3,5-difluorobenzyl)-3-[(6-[(dimethylamino)methyl]-3,4-dihydro-1*H*-isochromen-4-yl)amino]-2-hydroxypropyl]carbamate;

*N*³-[[(1*S*,2*R*)-1-(3,5-difluorobenzyl)-2-hydroxy-3-[(3-methoxybenzyl)amino]propyl]amino]carbonyl]-*N*¹,*N*¹-dipropyl-*b*-alaninamide; and

2-{{[(1*S*,2*R*)-1-(3,5-difluorobenzyl)-2-hydroxy-3-[(3-methoxybenzyl)amino]propyl]amino]carbonyl}amino}-*N,N*-dipropylethanesulfonamide.

20. A compound of the formula:



wherein

5 R_c is selected from -(CH₂)₀₋₃-(C₃-C₈) cycloalkyl wherein the cycloalkyl is optionally substituted with 1, 2, or 3 groups independently selected from -R₂₀₅; and -CO₂-(C₁-C₄ alkyl); -(CR₂₄₅R₂₅₀)₀₋₄-aryl; -(CR₂₄₅R₂₅₀)₀₋₄-heteroaryl; -(CR₂₄₅R₂₅₀)₀₋₄-heterocycloalkyl; -(CR₂₄₅R₂₅₀)₀₋₄-aryl-10 heteroaryl; -(CR₂₄₅R₂₅₀)₀₋₄-aryl-heterocycloalkyl; -(CR₂₄₅R₂₅₀)₀₋₄-aryl-aryl; -(CR₂₄₅R₂₅₀)₀₋₄-heteroaryl-aryl; -(CR₂₄₅R₂₅₀)₀₋₄-heteroaryl-heterocycloalkyl; -(CR₂₄₅R₂₅₀)₀₋₄-heteroaryl-heteroaryl; -(CHR₂₄₅-CHR₂₅₀-aryl); -(CR₂₄₅R₂₅₀)₀₋₄-heterocycloalkyl-heteroaryl; -(CR₂₄₅R₂₅₀)₀₋₄-heterocycloalkyl-heterocycloalkyl; -(CR₂₄₅R₂₅₀)₀₋₄-heterocycloalkyl-aryl; a monocyclic or bicyclic ring of 5, 6, 7 8, 9, or 10 carbons fused to 1 or 2 aryl, heteroaryl, or heterocycloalkyl groups;

15 wherein 1, 2 or 3 carbons of the monocyclic or bicyclic ring are optionally replaced with -NH-, -N(CO)₀₋₁R₂₁₅-,

-N(CO)₀₋₁R₂₂₀-, -O-, or -S(=O)₀₋₂-, and wherein the monocyclic or bicyclic ring is optionally substituted with 1, 2 or 3 groups that are independently -R₂₀₅, -R₂₄₅, -R₂₅₀ or =O;

5 and -C₂-C₆ alkenyl optionally substituted with 1, 2, or 3 R₂₀₅ groups;

wherein each aryl or heteroaryl group attached directly or indirectly to the -(CR₂₄₅R₂₅₀)₀₋₄ group is optionally substituted with 1, 2, 3 or 4 R₂₀₀ groups;

10 wherein each heterocycloalkyl attached directly or indirectly to the -(CR₂₄₅R₂₅₀)₀₋₄ group is optionally substituted with 1, 2, 3, or 4 R₂₁₀;

R₂₀₀ at each occurrence is independently selected from -C₁-C₆ alkyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -OH; -NO₂; -halogen; -C≡N; - (CH₂)₀₋₄-CO-NR₂₂₀R₂₂₅; - (CH₂)₀₋₄-CO-(C₁-C₈ alkyl); - (CH₂)₀₋₄-CO-(C₂-C₈ alkenyl); - (CH₂)₀₋₄-CO-(C₂-C₈ alkynyl); - (CH₂)₀₋₄-CO-(C₃-C₇ cycloalkyl); - (CH₂)₀₋₄-(CO)₀₋₁-aryl; - (CH₂)₀₋₄-(CO)₀₋₁-heteroaryl;

15 - (CH₂)₀₋₄-(CO)₀₋₁-heterocycloalkyl; - (CH₂)₀₋₄-CO₂R₂₁₅; - (CH₂)₀₋₄-SO₂-NR₂₂₀R₂₂₅; - (CH₂)₀₋₄-S(O)₀₋₂-(C₁-C₈ alkyl); - (CH₂)₀₋₄-S(O)₀₋₂-(C₃-C₇ cycloalkyl); - (CH₂)₀₋₄-N(H or R₂₁₅)-CO₂R₂₁₅;

20 - (CH₂)₀₋₄-N(H or R₂₁₅)-SO₂-R₂₂₀; - (CH₂)₀₋₄-N(H or R₂₁₅)-CO-N(R₂₁₅)₂; - (CH₂)₀₋₄-N(-H or R₂₁₅)-CO-R₂₂₀;

25 - (CH₂)₀₋₄-NR₂₂₀R₂₂₅; - (CH₂)₀₋₄-O-CO-(C₁-C₆ alkyl); - (CH₂)₀₋₄-O-(R₂₁₅); - (CH₂)₀₋₄-S-(R₂₁₅); - (CH₂)₀₋₄-O-(C₁-C₆ alkyl optionally substituted with 1, 2, 3, or 5 -F); -C₂-C₆ alkenyl optionally substituted with 1 or 2 R₂₀₅ groups; -C₂-C₆ alkynyl optionally substituted with 1 or 2 R₂₀₅ groups; adamantly, and - (CH₂)₀₋₄-C₃-C₇ cycloalkyl;

each aryl and heteroaryl group included within R₂₀₀ is optionally substituted with 1, 2, or 3 groups that are independently -R₂₀₅, -R₂₁₀ or -C₁-C₆ alkyl substituted with 1, 2, or 3 groups that are independently R₂₀₅ or R₂₁₀;

5 each heterocycloalkyl group included within R₂₀₀ is optionally substituted with 1, 2, or 3 groups that are independently R₂₁₀;

R₂₀₅ at each occurrence is independently selected from

10 -C₁-C₆ alkyl, -C₂-C₆ alkenyl, -C₂-C₆ alkynyl, -C₁-C₆ haloalkoxy, -(CH₂)₀₋₃(C₃-C₇) cycloalkyl, -halogen, -(CH₂)₀₋₆-OH, -O-phenyl, OH, SH, -(CH₂)₀₋₆-C≡N, -(CH₂)₀₋₆-C(=O)NR₂₃₅R₂₄₀, -CF₃, -C₁-C₆ alkoxy, C₁-C₆ alkoxy carbonyl, and -NR₂₃₅R₂₄₀;

15 R₂₁₀ at each occurrence is independently selected from -C₁-C₆ alkyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -C₂-C₆ alkenyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; C₁-C₆ alkanoyl; -SO₂-(C₁-C₆ alkyl); -C₂-C₆ alkynyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -halogen; -C₁-C₆ alkoxy; -C₁-C₆ haloalkoxy; -NR₂₂₀R₂₂₅; -OH; -C≡N; -C₃-C₇ cycloalkyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -CO-(C₁-C₄ alkyl); -SO₂-NR₂₃₅R₂₄₀; -CO-NR₂₃₅R₂₄₀; -SO₂-(C₁-C₄ alkyl); and =O;

20 R₂₁₅ at each occurrence is independently selected from -C₁-C₆ alkyl, -(CH₂)₀₋₂-(aryl), -C₂-C₆ alkenyl, -C₂-C₆ alkynyl, -C₃-C₇ cycloalkyl, -(CH₂)₀₋₂-(heteroaryl), and -(CH₂)₀₋₂-(heterocycloalkyl);

25 wherein the aryl group included within R₂₁₅ is optionally substituted with 1, 2, or 3 groups that are independently -R₂₀₅ or -R₂₁₀; wherein the heterocycloalkyl and heteroaryl groups included

30

within R₂₁₅ are optionally substituted with 1, 2, or 3 R₂₁₀;

R₂₂₀ at each occurrence is independently H, -C₁-C₆ alkyl, -CHO, hydroxy C₁-C₆ alkyl, C₁-C₆ alkoxy carbonyl, -amino C₁-C₆ alkyl, -SO₂-C₁-C₆ alkyl, C₁-C₆ alkanoyl optionally substituted with up to three halogens, -C(O)NH₂, -C(O)NH(C₁-C₆ alkyl), -C(O)N(C₁-C₆ alkyl)(C₁-C₆ alkyl), -halo C₁-C₆ alkyl, -(CH₂)₀₋₂₋(C₃-C₇ cycloalkyl), -(C₁-C₆ alkyl)-O-(C₁-C₃ alkyl), -C₂-C₆ alkenyl, -C₂-C₆ alkynyl, -aryl, -heteroaryl, or -heterocycloalkyl; wherein the aryl, heteroaryl and heterocycloalkyl groups included within R₂₂₀ and R₂₂₅ is optionally substituted with 1, 2, or 3 R₂₇₀ groups,

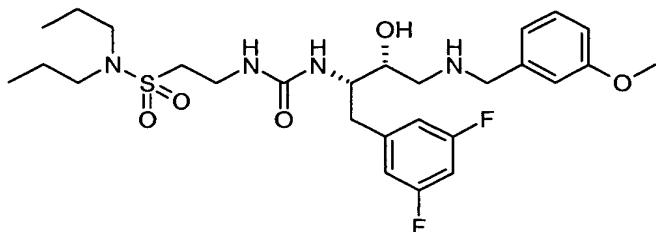
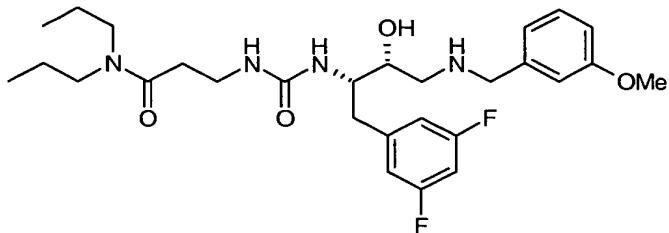
R₂₇₀ at each occurrence is independently -R₂₀₅, -C₁-C₆ alkyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -C₂-C₆ alkenyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -C₂-C₆ alkynyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -phenyl; -halogen; -C₁-C₆ alkoxy; -C₁-C₆ haloalkoxy; -NR₂₃₅R₂₄₀; -OH; -C≡N; -C₃-C₇ cycloalkyl optionally substituted with 1, 2, or 3 R₂₀₅ groups; -CO-(C₁-C₄ alkyl); -SO₂-NR₂₃₅R₂₄₀; -CO-NR₂₃₅R₂₄₀; -SO₂-(C₁-C₄ alkyl); and =O;

R₂₃₅ and R₂₄₀ at each occurrence are independently -H, -C₁-C₆ alkyl, C₂-C₆ alkanoyl, -SO₂-(C₁-C₆ alkyl), or -phenyl;

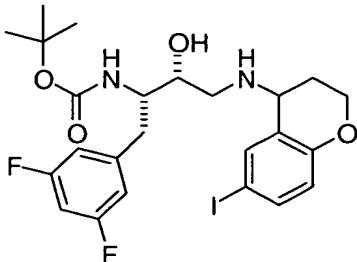
R₂₄₅ and R₂₅₀ at each occurrence are independently selected from H, -(CH₂)₀₋₄CO₂C₁-C₄ alkyl, -(CH₂)₀₋₄C(=O)C₁-C₄ alkyl, -C₁-C₄ alkyl, -C₁-C₄ hydroxy alkyl, -C₁-C₄ alkoxy, -C₁-C₄ haloalkoxy, -(CH₂)₀₋₄-C₃-C₇ cycloalkyl, -C₂-C₆ alkenyl, -C₂-

C₆ alkynyl, -(CH₂)₀₋₄ aryl, -(CH₂)₀₋₄ heteroaryl, and -(CH₂)₀₋₄ heterocycloalkyl, or
R₂₄₅ and R₂₅₀ are taken together with the carbon to which they
are attached to form a monocycle or bicyclic of 3, 4, 5, 6,
5 7 or 8 carbon atoms, where 1, 2, or 3 carbon atoms are
optionally replaced by 1, 2, or 3 groups that are
independently -O-, -S-, -SO₂-, -C(O)-, -NR₂₂₀-, or
-NR₂₂₀R₂₂₀- wherein both R₂₂₀ groups are alkyl; and wherein
the ring is optionally substituted with 1, 2, 3, 4, 5, or
10 6 groups that are independently C₁-C₄ alkyl, C₁-C₄ alkoxy,
hydroxyl, NH₂, NH(C₁-C₆ alkyl), N(C₁-C₆ alkyl)(C₁-C₆ alkyl),
-NH-C(O)C₁-C₅ alkyl, -NH-SO₂-(C₁-C₆ alkyl), or halogen;
wherein the aryl, heteroaryl or heterocycloalkyl groups
included within R₂₄₅ and R₂₅₀ are optionally
15 substituted with 1, 2, or 3 groups that are
independenly halogen, C₁₋₆ alkyl, CN or OH.

21. A compound which has the formula:



20 or

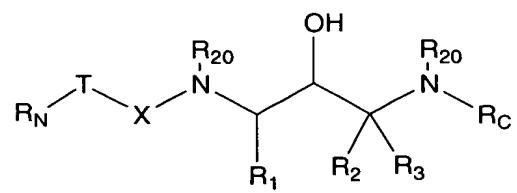


or a pharmaceutically acceptable salt thereof.

22. A method of treating a patient who has, or is
5 preventing a patient from getting, a disease or
condition selected from the group consisting of
Alzheimer's disease, for helping prevent or delay
the onset of Alzheimer's disease, for treating
patients with mild cognitive impairment (MCI) and
preventing or delaying the onset of Alzheimer's
disease in those who would progress from MCI to AD,
10 for treating Down's syndrome, for treating humans
who have Hereditary Cerebral Hemorrhage with
Amyloidosis of the Dutch-Type, for treating cerebral
amyloid angiopathy and preventing its potential
consequences, i.e. single and recurrent lobar
15 hemorrhages, for treating other degenerative
dementias, including dementias of mixed vascular and
degenerative origin, dementia associated with
Parkinson's disease, dementia associated with
progressive supranuclear palsy, dementia associated
20 with cortical basal degeneration, diffuse Lewy body
type of Alzheimer's disease and who is in need of
such treatment which comprises administration of a
therapeutically effective amount of a compound
selected from the group consisting of a substituted
25 aminoalcohol of the formula (I), or a
pharmaceutically acceptable salt or ester thereof,
wherein X, T, R₂₀, R₁, R₂, R₃, R_N and R_c are as
defined in claim 1.

30

23. A method for making a compound of formula I



or a pharmaceutically acceptable salt or ester thereof,
wherein X, T, R₂₀, R₁, R₂, R₃, R_N and R_C are as defined in claim
1.